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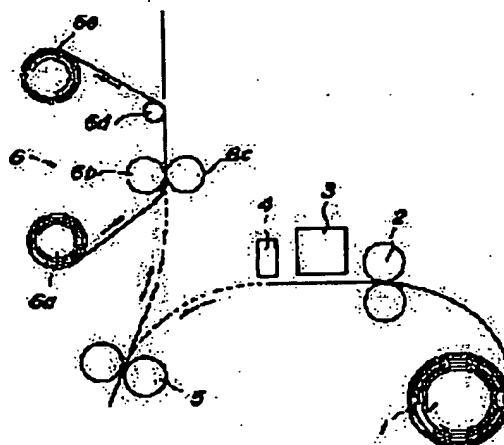
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## (54) INK JET RECORDER AND LAMINATOR

## (57)Abstract:

PROBLEM TO BE SOLVED: To provide an ink jet recorder and a laminator in which lamination can be finished beautifully by eliminating carriage of ink to a transfer fixing system under incompletely dried state regardless of the implantation quantity of ink.

SOLUTION: The ink jet recorder comprises a fixing means 6 for laminating a recording sheet disposed on the downstream side of the recording position of an ink jet recording head 3 in the carrying direction of recording sheet, means for detecting the density of ink ejected to the recording sheet from the recording head 3, means for detecting ink density on the recording sheet exceeding a specified level, and means for controlling the recording operation when the ink density exceeds the specified level.



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**CLAIMS**


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**[Claim(s)]**

[Claim 1] In the ink jet recording device which breathes out ink from a recording head and records on a record medium The fixing means which is arranged at the record-medium conveyance direction downstream, and carries out lamination processing rather than the record location by said recording head at said record medium, An ink consistency detection means to acquire the ink concentration consistency to the record medium by the ink regurgitation from said recording head, The ink jet recording device characterized by having a concentration detection means to detect that the ink concentration to said record medium exceeded the fixed value, and a record control means for controlling record actuation when said ink concentration exceeds a fixed value.

[Claim 2] Said record control means is an ink jet recording device according to claim 1 characterized by controlling the bearer rate of a record medium.

[Claim 3] Said record control means is an ink jet recording device according to claim 1 characterized by controlling the recording rate by said recording head.

[Claim 4] Said record control means is an ink jet recording device given in any 1 term of claim 1 characterized by controlling record actuation according to either [ at least ] environmental temperature or environmental humidity thru/or claim 3.

[Claim 5] The ink jet recording device according to claim 4 characterized by establishing a desiccation means to carry out the forced drying of the record medium to the upstream rather than the record-medium conveyance direction downstream and said fixing means rather than the record location by said recording head.

[Claim 6] It is the ink jet recording device according to claim 1 which can scan said recording head in the conveyance direction of a record medium, and the crossing direction, and is characterized by said ink consistency detection means acquiring the ink concentration consistency of the scanning unit of said recording head.

[Claim 7] Said record control means is an ink jet recording device according to claim 6 characterized by dividing into plurality the ink image which a recording head scans and records, and recording for every division pattern.

[Claim 8] An ink jet recording device given in any 1 term of claim 1 characterized by calculating the ink discharge quantity of a whole page from said record data, and controlling record actuation according to the whole concentration information in case the record data for 1 page are created thru/or claim 4.

[Claim 9] In the ink jet recording device which breathes out ink from a recording head and records on a record medium The fixing means which is arranged at the record-medium conveyance direction downstream, and carries out lamination processing rather than the record location by said recording head at said record medium, The ink jet recording device characterized by having the desiccation means to which it is prepared in the upstream by the record-medium conveyance direction downstream and said fixing means rather than the record location by said recording head, and stoving of the record medium is carried out, and the heating control means to which it carries out adjustable [ of the amount of heating of said desiccation means ].

[Claim 10] Said heating control means is an ink jet recording device according to claim 9 characterized by computing the moisture content of a record medium according to either [ at least ] environmental temperature or environmental humidity, and changing the amount of heating of said desiccation means according to this moisture content.

[Claim 11] Said heating control means is an ink jet recording device according to claim 9 characterized by changing the amount of heating of said desiccation means according to the ink discharge quantity from the recording head at the time of record.

[Claim 12] Said heating control means is an ink jet recording device according to claim 9 characterized by changing the amount of heating of said desiccation means according to the measurement result of the weight of the record medium after record.

[Claim 13] The ink jet recording device according to claim 1 or 9 characterized by said recording head carrying out the regurgitation of the ink using the heat energy which energizes on an electric thermal-conversion object according to a signal, and this electric thermal-conversion object emits.

[Claim 14] Lamination equipment carried out [ having the lamination means for performing lamination processing of a sheet, the desiccation means to which it is prepared in the sheet conveyance direction upstream rather than said lamination means, and stoving of the sheet is carried out, and the heating control means to which it carries out adjustable / of the amount of heating of said desiccation means / in the lamination equipment which performs lamination processing on a sheet, and ] as the description.

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## DETAILED DESCRIPTION

## [Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the lamination equipment which performs lamination processing on the ink jet recording device and sheet which are carried or connected to various information machines and equipment, such as a copying machine, a printer, and communication equipment.

[0002]

[Description of the Prior Art] Conventionally, the approach of forming air bubbles into ink with heat energy, making ink fly to a record medium by growth of these air bubbles and contraction as one of the ink jet record approaches, and forming an image is learned. Since the recording head by this method is excellent in frequency-response nature and can prepare many deliveries, it has the description that a recording rate can be made quick. In order for the head in which more deliveries are mounted to appear taking advantage of this description, to attain record of many lines by one writing scan and to drive ink into it and coincidence so much by one scan in recent years, the absorptivity of ink can ask for a higher thing from paper. For this reason, desiccation of paper takes time amount increasingly.

[0003] On the other hand, in order to aim at improvement in shelf life of a water resisting property, ozone resistance, etc. to the protection pan of the recording paper, the front face of a record object is made to carry out heating melting postcure of the resin film, or by the approach of carrying out heating melting postcure of the adhesion object applied to the resin film etc., a lamination layer is formed in a recording surface (lamination), and the approach of making a mothball possible is put in practical use by the ink jet recording device.

[0004]

[Problem(s) to be Solved by the Invention] However, the following faults will be produced, if it is in an ink jet recording device, and lamination is performed in it before this moisture dries since the moisture contained in ink is contained in the record object immediately after record on a front face in large quantities.

[0005] (1) A fixing roller carries out a temperature fall.

[0006] When \*\*\*\*(ing) and heating the recording paper to a fixing roller, the moisture contained in the recording paper evaporates, the heating value of a fixing roller is taken with the heat of vaporization, heating values (temperature) required for heating of the recording paper run short, and sufficient fixing may be unable to be performed.

[0007] (2) The specific heat of the recording paper increases.

[0008] Since the specific heat of the moisture contained in ink is larger than the specific heat of the recording paper, the specific heat of the recording paper with which ink was driven in in large quantities becomes large. For this reason, the heating values for making the recording paper into temperature required for fixing run short, and sufficient fixing may be unable to be performed.

[0009] (3) A steam is generated.

[0010] If the recording paper is heated with a fixing means for a lamination, the moisture contained in

the recording paper will evaporate. A wrap and the steam which lost the place to go to are inserted into the interface of the detail paper and a coating material by the laminate film in a detail-paper front face in this condition, and a laminate film is prevented from the detail paper and sticking. That is, sufficient fixing may be unable to be performed.

[0011] That is, in spite of aiming at protection of a record image and the recording paper and establishing the laminate film from the first, a result becomes unsightly with the air bubbles by evaporation of a steam.

[0012] So, in case it laminates in the record object which contained the above moisture so much, the upstream of a fixing assembly is equipped with a desiccation means, the moisture contained in a record object is dried below to water content laminable in a short time, and there are some which were made to laminate after that. The approach of drying hot blast by spraying a form is used by the heating fan who makes it dry by passing between two heated rollers as the desiccation approach, and heating a form rapidly.

[0013] However, since the amounts of ink driven in with an image on the occasion of record differ, the water content of the recording paper after record changes. That is, when the driven-in ink concentration consistency is high, water content is high, and water content also becomes low when an ink concentration consistency is low.

[0014] moreover, changing with record environments (temperature, humidity) gets to know the water content of said recording paper -- having -- \*\*\*\* -- further -- the class of form -- different -- \*\* -- \*\*

[0015] Therefore, when it dries in the fixed amount of heating, and the water content of a form is large, there is a possibility that the amount of desiccation may not fulfill an initial complement. Conversely, when water content is low, there is a possibility of heating too much and burning the recording paper itself.

[0016] This invention solves the above-mentioned technical problem, and irrespective of the amount of ink placing, the purpose loses conveyance to the imprint fixing system in the imperfect dryness of ink, and offers the ink jet recording device which can finish lamination processing beautifully, and the lamination equipment for it.

[0017]

[Means for Solving the Problem] The typical configuration concerning this invention for attaining the above-mentioned purpose In the ink jet recording device which breathes out ink from a recording head and records on a record medium The fixing means which is arranged at the record-medium conveyance direction downstream, and carries out lamination processing rather than the record location by said recording head at said record medium, An ink consistency detection means to acquire the ink concentration consistency to the record medium by the ink regurgitation from said recording head, It is characterized by having a concentration detection means to detect that the ink concentration to said record medium exceeded the fixed value, and a record control means for controlling record actuation, when said ink concentration exceeds a fixed value.

[0018] If it is in the above-mentioned configuration and the ink concentration consistency to a record medium becomes more than fixed, by controlling record actuation of changing a record-medium bearer rate or changing a recording rate, time amount until the record medium after record results to a fixing means will be controlled, and the drying time of ink will be fluctuated. It is performed that the dryness of the ink in a fixing means becomes fixed, and performs a high-definition surface protective finish by this.

[0019]

[Embodiment of the Invention] Next, the ink jet recording device concerning 1 operation gestalt of this invention is explained with reference to a drawing.

[0020] The [1st operation gestalt] With reference to drawing 1, the outline of the ink jet recording device in this operation gestalt is explained first. In addition, drawing 1 is the \*\* type explanatory view of the ink jet recording device with which the ink jet record means and the fixing means of a record medium were united.

[0021] With the {outline configuration of equipment} book operation gestalt, the long picture-like roll

sheet is used as a record medium. In addition, a record medium may be not only a roll sheet but a cut sheet, and may be the quality of the materials other than papers, such as a sheet plastic.

[0022] The recording paper 1 as a record medium is conveyed to a record means with the conveyance roller 2. The record means uses the ink jet recording method of a serial mold, namely, the direction in which it is carried in the carriage which a recording head 3 does not illustrate, and this carriage intersects the roll-sheet conveyance direction (it intersects perpendicularly with this operation gestalt) -- a round trip -- it is movable and an ink image is recorded on the recording paper 1 by carrying out the regurgitation of the ink according to a picture signal synchronizing with this migration from a recording head 3. Therefore, the recording head 3 is equipped with an energy generation means to generate the drop formation energy made to act on the liquid in the energy operation section prepared in a detailed liquid delivery (orifice), a liquid route, and a part of this liquid route, and this operation section.

[0023] Irradiate electromagnetic waves, such as the record approach using electric machine conversion objects, such as a piezo-electric element, as an energy-generation means generate such energy, and laser, make them generate heat, and there is the record approach using an energy-generation means heat a liquid and make a liquid breathe out with electric thermal-conversion objects, such as a heater element which has the record approach using an energy-generation means make a drop breathe out in the operation by this generation of heat, or an exoergic resistor, etc.

[0024] Since the recording head used for the ink jet record approach of making a liquid breathing out with heat energy also in it can arrange the liquid delivery (orifice) for breathing out the drop for record and forming the drop for regurgitation to high density, it can record high resolution. The recording head which used the electric thermal-conversion object as an energy generation means also in it is easy also for miniaturization, and high-density-assembly-izing is easy for it, and it is advantageous from a manufacturing cost being cheap.

[0025] In addition, according to a record signal, it energizes on an electric thermal-conversion object as a regurgitation configuration of ink, and it constitutes from this operation gestalt so that it may record by breathing out ink from a delivery by growth of the air bubbles produced in ink using film boiling produced in ink with the heat energy, and contraction. And after record is completed, the recording paper 1 is separated by the paper cutter 4 by predetermined die length.

[0026] Next, after the cut detail paper 1 is sent to the switch back roller 5 along with the guide which is not illustrated and this switch back roller 5 conveys the detail paper 1 to a specified quantity switchback path, it is carrying out an inversion drive, and the detail paper 1 after record is conveyed to the fixing means 6 which is a lamination means.

[0027] With the recording paper with which donor roll 6a which carries out imprint fixing of the laminate film on the recording paper front face on which the ink image was recorded, and becomes the supply origin of a laminate film has switchbacked the fixing means 6 in this operation gestalt, it is drawn in the imprint rollers 6b and 6c, and elevated-temperature sticking by pressure is performed here. And winding roller 6e of the base film which is the remainder after an imprint is operating by exfoliation roller 6d which exfoliates a base film. In this way, the recording paper with which imprint fixing of the laminate film was carried out is discharged by the front face out of equipment.

[0028] {Control configuration} drawing 2 is the configuration block of the control means of the above-mentioned ink jet recording apparatus. In this drawing, the components with which an ink jet recording apparatus is usually equipped, and a control means, for example, the Centronics parallel interface section which receives record data from a host system and which is an interface and the power supply section of this equipment, are omitting.

[0029] CPUs10, such as a microprocessor, manage control of this whole recording device, and the program (the flow chart of drawing 3 shows a part) and the various data of the supervisory control are stored in ROM11. RAM12 which is the memory of a working-level month shall be freely used as a work area at the time of activation in that case.

[0030] The conveyance motor control section 14 which controls the conveyance motor 13 which drives the conveyance roller 2 grade which conveys the recording paper, and the carriage motor-control section 16 which controls the carriage motor 15 made to move the carriage which carried the recording head to

the conveyance direction and perpendicular direction of the recording paper are equipped, and this carriage motor-control section 16 records in fact by cooperating with the head drive frequency control section 17 for making ink breathe out from a recording head 3. Moreover, at this time, record data are stored in the memory 18 for images, are read in accordance with the ink regurgitation period of a head, and are sent to the shift register in a recording head 3. Here, in case image data is sent to a head, the dot counted value test section 19 which detects (this is called "dot counted value") for whether there are any data with which which actually records intervenes.

[0031] It is the thing of being making the ink of a predetermined color breathe out recording here.

Furthermore, it consist of the temperature psychrometry sections 21 which measure the environmental temperature use as the judgment of ink concentration, a desiccation conditioning means 20 to choose actual treatment, and a condition parameter of desiccation control, and humidity so that the recording paper after record on a fixing means can be send by suitable dryness from the dot count of the line.

[0032] If it is in the ink jet recording device of a {record motion-control} book operation gestalt, record actuation is controlled to be in suitable dryness, by the time it is conveyed by the fixing means 6 from the recording paper with which the ink image was formed. Next, the configuration and actuation for it are explained.

[0033] If the image data for every configuration color which received from the information processor is developed in the memory 18 for images, the dot counted value test section 19 will be performed, and the dot count of the record line will be measured. This value is passed to the desiccation conditioning means 20, and is memorized by RAM12. Moreover, the measurement result of the temperature psychrometry section 21 is similarly passed to the desiccation conditioning means 20, and is memorized by RAM12.

[0034] Drawing 3 is a flow chart which shows the procedure which controls record actuation according to ink concentration.

[0035] First, in step 100, an ink consistency detection means performs record concentration consistency count. This concentration consistency count computes whether from the dot counted value stored in RAM12, the case where the regurgitation is carried out from all the nozzles of a whole line is made into 100%, and it breathes out at what rate, and is utterly. Here, each consistency is computed according to the number of the ink colors which constitute a recording head 3. If it is 6 color ink head of black, yellow, dark cyanogen, light cyanogen, a dark Magenta, and a light Magenta, these six consistency values will be acquired.

[0036] Furthermore, environmental temperature or humidity is acquired at step 200. It is beforehand determined by the detail paper and the adopted ink raw material on which conditions specific gravity is taken, and it is held as data at ROM11. At this time, the concentration consistency  $T_e$  which also considered (step 300) and an environmental condition is obtained according to temperature conditions or humidity conditions by applying the amounts  $\Delta T_t$  or  $\Delta T_h$  of amendments to the concentration consistency of each color. In addition,  $\Delta T_t$  is the amount of amendments computed according to temperature conditions, and  $\Delta T_h$  is the amount of amendments computed according to humidity conditions.

[0037] And it detects that the ink concentration to the recording paper exceeded the fixed value with the concentration detection means. At least one of said six consistency values of this detection is judged by whether there is any line of a color with the concentration exceeding certain threshold  $T$  (step 400).

[0038] Threshold  $T$  is experimentally drawn according to the recording paper adopted as each recording device. With the magnitude of this amended concentration consistency  $T_e$ , the optimal candidate for actuation is searched from a table as acquisition for [ of step 500 ] the optimal actuation classified by concentration. The candidate for actuation here is the conveyance motor 13, the carriage motor 15, or a regurgitation frequency. And when ink concentration exceeds a threshold, record conditions (modification of the rate of the conveyance motor 13 or the carriage motor 15 or a regurgitation frequency) are determined by the record control means to the candidate for actuation determined at said step 500 so that the recording paper may be in dryness fixed to the time amount conveyed from the recording start to the fixing means 6 (step 600).

[0039] That is, by reducing a recording rate, when threshold  $T$  becomes beyond a predetermined value,



or reducing a recording paper bearer rate, by lengthening time amount until the recording paper after record results in the fixing means 6, and making it season naturally in the meantime, it controls so that lamination processing is not performed by imperfect dryness.

[0040] In addition, in order to cheat to still more suitable dryness, a process until it results in this fixing means 6, and the stoving means for performing quicker efficient desiccation in a switchback process until the detail paper after record specifically results in the fixing means 6 may be established auxiliary.

[0041] The above-mentioned auxiliary heat desiccation means 22 (refer to drawing 2 ) makes still more uniform dryness to the process which controls record actuation by ink concentration and makes desiccation of the recording paper homogeneity as mentioned above. Although [ here / it being able to attain the main purpose even if the recording device of this operation gestalt uses an air drying as mentioned above, and performing desiccation control at the time of the chief aim of this operation gestalt being record to the last synchronous ] it is auxiliary, it is because it is the auxiliary thing to which a quicker and more uniform condition will be made by the time the recording paper is conveyed by the fixing means 6.

[0042] According to this operation gestalt, as explained above, by the time the recording paper immediately after record for the fixing means 6 is conveyed, it cannot be based on the amount of ink placing or record environment to the recording paper, but suitable dryness can be made, breakage and poor fixing of a laminate film can be prevented, and lamination processing can be finished beautifully.

[0043] The [2nd operation gestalt] Drawing 4 is the configuration block Fig. of the ink jet recording apparatus of the 2nd operation gestalt of this invention. Since others are the same only by the 1st operation gestalt and control configuration which mentioned this operation gestalt above differing from each other, a part different here is explained and the overlapping explanation is omitted.

[0044] The big description of this operation gestalt is the point that the block (this is called "controller section") which has the record device control means which has another host CPU 40 represented by the information processor to the block (this is called "engine control section") which a printer CPU 30 controls is connected independently. Even if this controller section is an information processor connected to the recording apparatus of this operation gestalt, and it connects with the engine section physically within equipment, it is not cared about.

[0045] There is the host CPU 40 represented by the microprocessor which manages the control in the controller section, and it has the image memory 42 which stores an image formation means 41 to perform a rendering and ink color separation, and its image data. This image data lets the interface control means 43 pass, and is transmitted to the engine section. Similarly, the engine section is controlled via said interface control means 43 as a command from the record control means 44 which controls record activation to the engine section.

[0046] Furthermore, in the controller section, a dot count measurement means 45 to measure the dot count of a whole page, and a desiccation conditioning means 47 to determine the desiccation conditions in the whole page record etc. as the temperature psychrometry means 46 and list which acquire environmental temperature or humidity information are provided with reference to the binary-ized data in an image memory 42.

[0047] On the other hand, the engine section possesses the regurgitation frequency control means 35 in the conveyance motor control means 33 for making it record on the image memory 31 which stores the printer CPU 30 which controls the engine section, the interface control means 32 which receives the data from the controller section, and its data, and the conditions specified from a controller, the carriage motor control means 34, and the list. Moreover, the auxiliary heat desiccation means 36 is equipped like the 1st operation gestalt mentioned above. However, the heat desiccation means itself is having that ambient temperature controlled also by this operation gestalt by the desiccation conditioning means of the controller section. Incidentally, each controlled systems, such as a recording head, are not indicated all over drawing.

[0048] The fundamental flow for the desiccation condition decision which consists of the above-mentioned configuration in this operation gestalt is the same as that of the flow chart ( drawing 3 ) shown with the 1st operation gestalt almost. However, it is [ rather than it uses the concentration

consistency of the record line as a prerequisite ] that the methods of the 1st operation gestalt and processing differ fundamentally to ask for the concentration consistency of the whole page which the image formation means of the controller section created.

[0049] The concentration consistency  $D_p$  of a whole page has environmental conditions, such as temperature and humidity, considered, and is transposed to the amendment concentration  $D_e$ . It is determined how if there is a color with the concentration which exceeds the threshold  $T_p$  to the concentration of a whole page similarly, it should record as a whole page with the desiccation conditioning means 47 here by searching candidates for actuation, such as a conveyance motor and a carriage motor, in order to make it suitable desiccation conditions. It opts also for a setup of the ambient temperature of the auxiliary heat desiccation means 36 at this time. And a command definition is carried out by the record control means 44, and the determined record approach lets the interface control means 43 pass, and is notified to the engine section here. The engine section which received this notice performs a record setup as directions of this command, and performs the usual record sequence irrespective of the height of the concentration consistency of an image.

[0050] Since the dot count of the whole recording surface can be acquired according to this operation gestalt in case the data of a page are created in an information processor in addition to the effectiveness of the 1st operation gestalt as explained above Can grasp the concentration consistency as the whole recording paper, and environmental temperature and the measured value by the humidity measurement means because an information processor acquires Before beginning record by the information-processor side, the suitable recording rate according to the recording paper and environment can be set up beforehand, and it can contribute to improvement in a result of a laminate film. Furthermore, the effectiveness that deterioration of image quality, such as \*\*\*\* nonuniformity, is avoidable is also expectable by a whole page being recorded with constant speed.

[0051] Furthermore, if information processors, such as a personal computer, are substituted for the controller section, since there is no additional hardware element [ a load / the load by the side of the controller section is not heavy, and ] with high-performance-izing of a microprocessor in recent years, it will become possible to process all by software, and expectation of improvement in the speed can also be performed. Furthermore, since an engine section side can be simplified, the effectiveness of leading also to the cost cut of the recording device itself is acquired.

[0052] The [3rd operation gestalt] The ink image which a recording head scans and records as the 3rd operation gestalt is divided into plurality, and the record motion control which records for every division pattern is explained. In addition, the element block constituted from this 3rd operation gestalt except that the candidate for actuation for making it the suitable dryness shown with the 1st operation gestalt mentioned above is restricted only to the conveyance motor control means is the same. This is used as what does not have other candidates for actuation in drawing 2 .

[0053] First, the same flow as the 1st operation gestalt is taken until the amendment concentration consistency  $T_e$  in consideration of an environment is determined.

[0054] next, when larger than threshold  $T_h$  with the ink consistency  $T_e$  of that n-th line recorded, 1 block the image recorded with the scan of this n-th line as an image of two or more blocks divided into m pieces These blocks of two or more will be recorded at a time with m scans, and time amount which scans accommodation of the record area of the ink recorded at a time and the image of the n-th line by changing the number which divides this image, and the count m to scan is adjusted.

[0055] Drawing 5 is what divided the record line into the pattern of (a) and (b), and the approach of this operation gestalt divides the image of the n-th line into two patterns, (a) and (b), like drawing 5 , and records it with two scans. For example, the pattern of (a) is recorded on an outward trip and the pattern of (b) is recorded in a return trip. According to this conditioning, the area of the ink in which it is recorded since an image is divided and the part with the high consistency of an image is recorded becomes small, and desiccation of ink becomes early compared with the image when not being divided. Moreover, by increasing the count of a scan, the time amount which records this n-th line becomes long, and the recorded ink is dried in this time amount.

[0056] Without reducing a recording rate sharply, even when it is hard to dry the ink in which many

placing of ink was recorded according to this operation gestalt, as explained above, at least, by the time it is needed for a fixing means, suitable time amount can be made to go through, and the same effectiveness as the 1st operation gestalt can be obtained.

[0057] The [4th operation gestalt] The equipment which dries moisture compulsorily before a lamination is explained as an ink jet recording device applied to the 4th operation gestalt of this invention with reference to drawing 6 thru/or drawing 9 next. In addition, drawing 6 is the \*\* type explanatory view of the ink jet recording device concerning the 4th operation gestalt, and the \*\* type strabism explanatory view of a lamination process and drawing 9 of the explanatory view in which drawing 7 shows a lamination process, and drawing 8 are the cleaning configuration explanatory views of a fixing roller.

[0058] In {whole configuration} drawing 6, the recording paper cartridge which contained the conveyance roller for the ink jet recording head which 51 breathes out ink to a record medium and forms an ink image, and 52 to convey the recording paper, and the roll sheet whose 53 is a record medium, and 54 are cutters which cut the recording paper in a predetermined location. Moreover, a cooling means for the fixing means for a desiccation means for 55 drying the recording paper after record and 56 being arranged rather than a record location at the recording paper conveyance direction downstream, laminating the recording paper front face after record, and an ink image being established and 57 to cool the recording paper, the separation section from which 58 separates the recording paper and a lamination base film, the delivery roller with which 59 discharges the recording paper, and 60 are the paper output trays which receive the discharged recording paper.

[0059] An intermittent feed is improved the detail paper 61 currently wound around the detail-paper cartridge 53 interior in the shape of a roll by precision with the conveyance roller 52, and an image is formed in the front face of the ink jet recording head 51. In addition, the record means uses the ink jet recording method of the same serial mold as the 1st operation gestalt mentioned above.

[0060] After record termination, the back end is fast forwarded to the location which passes a cutter 54, and the recording paper 61 is cut. The cut recording paper 61 is conveyed by the desiccation means 55 by the non-illustrated conveyance system. The recording paper 61 by the side of a roll is pulled back by the inverse rotation of the conveyance roller 52 and the recording paper 61 to a record ready position by coincidence.

[0061] In the ink jet recording apparatus in this operation gestalt, the record object which is rich in gloss and is excellent in weatherability can be made by coating with transparent resin the detail paper into which ink was driven in the fixing means 56 by the ink jet recording head. However, a record object must be dried in order to laminate the recording paper into which ink was driven in large quantities immediately after record, since a lot of moisture is contained in ink.

[0062] In order to solve this trouble, the desiccation means 55 is established with this operation gestalt. That is, before coating the detail paper into which ink was driven in large quantities, the moisture contained in record Kaminaka's ink is evaporated compulsorily possible [ a lamination ].

[0063] {Desiccation means} Here, the configuration of the desiccation means 55 is explained concretely. In drawing 6, the desiccation pressurization roller of the product [ front face / where the desiccation heating roller of the hollow of the product / front face / made of silicone rubber and 55b are pressed for 55a by desiccation heating roller 55a according to the press device in which it does not illustrate ] made of silicone rubber, and 55c are drying heaters which are inserted in the centrum of desiccation heating roller 55a in the air, and heat desiccation heating roller 55a. Moreover, when 55d is a conveyance path change flap, forming the conveyance path which connects a record means and a desiccation means when leading the recording paper recorded and cut to the desiccation means 55, and leading the dried recording paper to a fixing means, it rotates so that the conveyance path which connects a desiccation means and a fixing means may be formed. 55e is desiccation nip formed of desiccation heating roller 55a and desiccation pressurization roller 55b.

[0064] Calculation of the moisture content of the form according to the temperature and humidity of the detail-paper cartridge 53 interior which were measured by thermometer 53a which 55f was a heater temperature controller as a heating control means, and was prepared in equipment in order to measure

equipment environmental temperature and humidity, and hygrometer 53b, Added the ink discharge quantity further obtained from the ink jet recording head control section 62 to the value. To compute the moisture content of the form immediately after record, and to become the temperature of extent which does not spoil image quality and the quality of a form, and the skin temperature which obtains the amount of desiccation required for a lamination, heater temperature is adjusted and heating roller skin temperature is controlled.

[0065] According to the paper size, the moisture content of the form by temperature and humidity is beforehand inputted into the interior of 55f of heater temperature controllers here, and the moisture content of a current form is computed by testing this value, and the temperature inside a current cartridge and humidity by comparison. Moreover, at the ink jet recording head control section 62, whenever it records one sheet, the count of the ink regurgitation from a nozzle is measured, and the amount of regurgitation ink to the whole form is measured by applying the amount of regurgitation ink per time to this count of the regurgitation.

[0066] The recording paper 61 cut by the cutter 54 is pinched by the non-illustrated paper conveyance system like the above-mentioned at desiccation nip 55e. Since desiccation heating roller 55a and desiccation pressurization roller 55b carry out pressurization contact and are rotating, both drying-heater 55c becomes hot. Moreover, it is heated by the temperature of extent which does not spoil image quality and the quality of a form, the temperature control of the temperature of desiccation nip 55e being carried out, and obtaining the amount of desiccation required for a lamination by 55f of heater temperature controllers.

[0067] For this reason, in case the recording paper 61 passes desiccation nip 55e, it is heated, and it evaporates rapidly the moisture contained in ink from immediately after nip passage. That is, the recording paper is heated while being heated with both the rollers 55a and 55b. And since there is no steamy refuge when the recording paper is inserted into the nip by the rubber roller, it cannot evaporate, but if the recording paper passes nip, evaporation will be rapidly performed by the heat energy stored in the recording paper and ink. The following effectiveness is acquired according to this desiccation process at the time of lamination fixing.

[0068] That is, since the moisture content contained in the recording paper decreases, even if it makes the recording paper into an elevated temperature in the fixing means 56, there is little generating of a steam, and generating of air bubbles can be prevented. Moreover, even if it makes it an elevated temperature with the fixing means 56, there can be little heat energy taken with heat of vaporization, can heat the recording paper to the temperature near a fixing roller, and can supply sufficient heat energy to denature a lamination layer. If in other words the heat energy of tales doses is given, a fixing roller can be used at lower temperature. Furthermore, since the specific heat (heat capacity) of the recording paper becomes small, the recording paper can be heated to the temperature near a fixing roller, and sufficient temperature for denaturation \*\*\*\* can be maintained for a lamination layer.

[0069] Since steamy generating of the recording paper after desiccation nip passage decreases, when closing by fixing nip, a steam closes, eye \*\* is lost, and it stops moreover, spoiling the adhesion of the recording paper and an imprint sheet.

[0070] Furthermore, since the recording paper is an elevated temperature, in the fixing means 56, the recording paper becomes the temperature near a fixing roller for a short time, and temperature sufficient by the short time amount (for example, 0.1 - 0.3 seconds) which passes nip to denature a lamination layer can be secured. If in other words the recording paper is raised to the same temperature, a fixing roller can be used at lower temperature.

[0071] In the fixing means 56, lamination fixing processing of the record medium in which it carried out and moisture evaporated with the desiccation means is carried out like the {fixing means} above. Next, the configuration of this fixing means is explained concretely. This fixing means (lamination means) functions on the recording paper as lamination equipment which carries out lamination processing.

[0072] The recording paper which carried out 2nd passage to desiccation nip 55e passes along the fixing conveyance system 63, and a tip contacts imprint sheet 56a. As imprint sheet 56a is shown in drawing 7 and drawing 8, the surface material layer 56a2 and the adhesive layer 56a3 are produced on the base

material 56a1. An adhesive layer 56a3 is united with the recording paper 61 a pressure welding and by heating at the recording paper 61, and a recording paper front face is coated with the surface material layer 56a2 through an adhesive layer 56a3 by exfoliating the base material 56a1 after cooling with the cooling means 57 in this.

[0073] 56d of fixing heating rollers with which it \*\*\*\*(ed) and the surface measures of a silicon system or a fluorine system were taken against guide-idler 56c and a front face from roll 56b, and a front face roll round imprint sheet 56a through fixing nip 56f which consists of fixing pressurization roller 56e covered by the fluorine system tube by the product made of silicone rubber, and it is rolled round by roll 56g. It is the fixing heater which is inserted in the centrum of 56d of fixing heating rollers in the air 56h, and heats 56d of fixing heating rollers. Rolling-up roll 56g, while the rotation drive of the direction which winds up imprint sheet 56a is possible, it has the rotation regulation or this structure in predetermined torque to the direction which rewinds imprint sheet 56a. While it \*\*\*\* and the rotation drive of the direction which rewinds imprint sheet 56a is possible for roll 56b contrary to this, it has the rotation regulation or this structure in predetermined torque to the direction which winds up imprint sheet 56a. That is, it wound up to imprint sheet 56a, tension worked in rewinding and any direction, and generating of Siwa is prevented. The width of face of imprint sheet 56a is large slightly from the recording paper 61, and even if both crosswise locations shift somewhat, it can cover the whole recording paper surface.

[0074] After the recording paper 61 contacts imprint sheet 56a first, by fixing nip 56f, it is inserted with imprint sheet 56a, and is pressurized and heated. By contacting imprint sheet 56a first in the recording paper 61, a recording paper tip bends and being pressurized and heated in the chip box \*\*\*\*\* condition is prevented. After that, it is cooled with the cooling means 57, and the recording paper 61 is delivered to a paper output tray 60 with the delivery roller 59, after curvature separation is carried out in the separation section 58.

[0075] Next, cleaning of fixing pressurization roller 56e in a fixing process is described. When the recording paper 61 is inserted in fixing nip 56f with imprint sheet 56a, the adhesive layer on the imprint sheet of the part which counters the recording paper is imprinted by the recording paper, but in imprint sheet 56a, since width of face is wider than the recording paper 61, the adhesive layer 56a3 outside the recording paper range contacts the front face of fixing pressurization roller 56e. Furthermore, if it takes preventing the lap of the recording paper into consideration even if the recording paper 61 is inserted continuously, between papers cannot be made into zero but the adhesive layer 56a3 of the part which corresponds between papers will contact the front face of fixing pressurization roller 56e.

[0076] Although the fixing pressurization roller front face has the front-face nature which it is covered by the fluorine system tube and a foreign matter cannot adhere easily, and is easy to remove even if it adheres, in the above-mentioned configuration, adhesion of foreign matters (that to which a part of adhesive layer 56a3 adhered) cannot be prevented completely. If a foreign matter adheres to a fixing pressurization roller front face, with rotation of a roller, a foreign matter will imprint to the adhesive layer 56a3 of imprint sheet 56a, finally will imprint on a recording paper front face, and will spoil record grace.

[0077] So, with this operation gestalt, in order to wipe off a foreign matter, the nonwoven fabric was made to contact the front face of fixing pressurization roller 56e, and the cleaning means which wipes off a foreign matter is established.

[0078] 70 is a cleaning means, and 70a is the nonwoven fabric rolled in the shape of a roll, it is \*\*\*\* (ed), is pressed from roll 70b, and is rolled round by rolling-up roll 70d through roller 70c. It presses and roller 70c is pressed by fixing pressurization roller 56e by the non-illustrated pressurization member by the product made of foamed rubber. Therefore, nonwoven fabric 70a is pressed by the front face of fixing pressurization roller 56e. If fixing pressurization roller 56e rotates, nonwoven fabric 70a will incorporate the adhering foreign matter between fibers, and will wipe off the foreign matter of the front face of fixing pressurization roller 56e. rolling-up roll 70d -- a non-illustrated drive -- an intermission -- it is rotatable, when a foreign matter carries out considerable-amount adhesion at nonwoven fabric 70a of the part which is in contact with the fixing pressurization roller front face, it rotates, and a new

nonwoven fabric side is pulled out in the contact section with a fixing pressurization roller front face. A fixing pressurization roller front face is maintained at the condition that there is always no adhesion of a foreign matter by this device.

[0079] The same device is established also near the desiccation heating roller 55a of the desiccation means 55, and the above-mentioned cleaning means 70 has removed the dirt by the imprint to the roller front face of a recording surface.

[0080] Thus, the temperature of the detail-paper cartridge 53 interior and humidity are measured, and the moisture content of the detail paper 61 is measured. The amount of desiccation for making it water content laminable by measuring the amount of regurgitation ink at the time of record furthermore, and measuring the moisture content immediately after record is computed. By adjusting the amount of heating in the desiccation means 55 in order to obtain this amount of desiccation, troubles, such as lack of the amount of desiccation when the moisture content of the recording paper is large, and debasement of the recording paper twisted for heating too much when there is little moisture content, are solvable.

[0081] The [5th operation gestalt] In the 4th operation gestalt mentioned above, although the heating pressurization device in which the roller pair was used for the desiccation means 55 was used, a device is not limited to this. The 5th operation gestalt describes the example of the desiccation means 80 using a heating fan, as shown in drawing 10. In addition, except desiccation means 80, since it is the same as that of the 4th operation gestalt mentioned above, explanation is omitted.

[0082] 80a is a heating fan and hot blast is sprayed on the recording surface of the direct recording paper. 80b is a desiccation tunnel, in the space sealed to some extent, is making hot blast ventilate and is aiming at the rise of effectiveness. 80c is a jet pipe and has discharged to the exterior the air ventilated from heating fan 80a to desiccation tunnel 80b. When 55d is a conveyance path change flap, forming the conveyance path which connects a record means and the desiccation means 80 when leading the recording paper recorded and cut to the desiccation means 80, and leading the dried recording paper to the fixing means 56, it rotates so that the conveyance path which connects the desiccation means 80 and the fixing means 56 may be formed.

[0083] 55f is a heater temperature controller and is adjusting the temperature of the air which controls the heater inside a heating fan and ventilates like the 4th operation gestalt. Since conveyance of the recording paper is the same as that of the 4th operation gestalt, it omits explanation.

[0084] When said desiccation means 80 is used, how adjustment of the amount of heating lessens a fan's drive time amount which lowers the temperature of hot blast can be considered, and control is comparatively easy compared with roller drying.

[0085] The [6th operation gestalt] The example in which the recording paper carries out moisture content measurement is explained with reference to drawing 11 by measuring the weight of the recording paper after record directly as the 6th operation gestalt below. Moreover, the ink jet recording head 51, the detail-paper cartridge 53, and a cutter 54 do not exist, but like the 4th operation gestalt mentioned above with this operation gestalt, it has the composition of having become independent as lamination equipment, and the record object recorded by the external recording mechanism is carried in, and it constitutes so that lamination processing of this may be carried out. Moreover, except for the form weight measurement means 90 existing in the conveyance direction upstream of the recording paper, other parts are the same as that of the 4th operation gestalt than the desiccation means 55.

[0086] 90 is a form weight measurement means, 90a is a recording paper tray and the recording paper 61 inserted from the exterior is conveyed by conveyance roller 90b on recording paper tray 90a. The form inserted here is reading the marker with which form distinction sensor 91a's is prepared in the exclusive form in the form distinction means 91. It is the form specified beforehand or the size is distinguished, when the recording paper of the size other than an exclusive form and besides an assumption is inserted, from the form distinction means 91, a signal is sent to a non-illustrated conveyance roller control section, the conveyance roller 52 is reversed, and the recording paper is discharged to the exterior. The nip of conveyance roller 90b is canceled by the nip discharge device in which it does not illustrate, after the recording paper's 61 reaching on recording paper tray 90a. Then, weight is measured by the weight measuring instrument of 90c, and measured value is transmitted to the 55f of the above-mentioned

heater temperature controllers. In 55f of heater temperature controllers, the comparison with the paper size transmitted from the weight and the form distinction means 91 after the transmitted record and recording paper weight required for the lamination in the exclusive form and size which are measured beforehand and checked is performed, and the moisture content which should be dried is computed. That it should make the temperature of extent which furthermore does not spoil image quality and the quality of the recording paper, and the skin temperature which obtains the amount of desiccation required for a lamination, heater temperature is adjusted and heating roller skin temperature is controlled.

[0087] Also in such a configuration, it can dry below to laminable moisture content like the 4th operation gestalt mentioned above, without spoiling the image quality and quality of the recording paper. By furthermore having separated the record means, improvement in the convenience that the miniaturization of equipment and the record object in other recording devices are also laminable is expectable.

[0088] Since neglect until the moisture in ink seasons naturally by drying the record medium after record compulsorily with a desiccation means becomes unnecessary and becomes laminable further at high speed as it indicated the 4th operation gestalt thru/or the 6th operation gestalt that it explained above, productivity improves.

[0089] Moreover, by adjusting that the amount of heating in a desiccation means should be made the optimal, fault heating when there is little recording paper moisture content after record, and when there is much moisture content conversely, the problem that there are few amounts of desiccation can be avoided, and deterioration of the recording paper quality after a lamination can be prevented.

[0090] Operation gestalt] besides [ Although the example which controlled the recording paper bearer rate and the recording rate by the recording head as what a record control means controls was shown, you may make it these control not only when controlling either a recording paper bearer rate and the recording rate by the recording head, but both sides by the operation gestalt mentioned above, when ink concentration exceeds a threshold.

[0091] Moreover, although the water content of the recording paper was detected from the both sides of environmental temperature and environmental humidity with the operation gestalt mentioned above, you may make it this detect water content from either environmental temperature or environmental humidity.

[0092]

[Effect of the Invention] Since this invention was constituted as mentioned above, irrespective of the amount of ink placing, conveyance to the imprint fixing system in the imperfect dryness of ink is lost, and it becomes possible to finish lamination processing beautifully.

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[Translation done.]

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## DESCRIPTION OF DRAWINGS

## [Brief Description of the Drawings]

[Drawing 1] It is the \*\* type explanatory view of the ink jet recording device with which the ink jet record means and the fixing means of a record medium were united.

[Drawing 2] It is the configuration block of the control means of an ink jet recording apparatus.

[Drawing 3] It is the flow chart which shows the procedure which controls record actuation according to ink concentration.

[Drawing 4] It is the configuration block Fig. of the ink jet recording apparatus of the 2nd operation gestalt of this invention.

[Drawing 5] It is the explanatory view of the operation gestalt which divides and records a record line on a pattern.

[Drawing 6] It is the \*\* type explanatory view of the ink jet recording device concerning the 4th operation gestalt.

[Drawing 7] It is the explanatory view showing a lamination process.

[Drawing 8] It is the \*\* type strabism explanatory view of a lamination process.

[Drawing 9] It is the cleaning configuration explanatory view of a fixing roller.

[Drawing 10] It is the \*\* type explanatory view of the ink jet recording device concerning the 5th operation gestalt.

[Drawing 11] It is the \*\* type explanatory view of the equipment concerning the 6th operation gestalt.

## [Description of Notations]

- 1 -- Record Medium
- 2 -- Conveyance Roller
- 3 -- Recording Head
- 4 -- Paper Cutter
- 5 -- Switch Back Roller
- 6 -- Fixing Means
- 6a -- Donor roll
- 6b and 6c -- Imprint roller
- 6d -- Exfoliation roller
- 6e -- Winding roller
- 10 -- CPU
- 11 -- ROM
- 12 -- RAM
- 13 -- Conveyance Motor
- 14 -- Conveyance Motor Control Section
- 15 -- Carriage Motor
- 16 -- Carriage Motor Control Section
- 17 -- Head Drive Frequency Control Section
- 18 -- Memory for Images



19 -- Dot Counted Value Test Section  
20 -- Desiccation Conditioning Means  
21 -- Temperature Psychrometry Section  
22 -- Auxiliary Heat Desiccation Means  
30 -- Printer CPU  
31 -- Image Memory  
32 -- Interface Control Means  
33 -- Conveyance Motor Control Means  
34 -- Carriage Motor Control Means  
35 -- Regurgitation Frequency Control Means  
36 -- Auxiliary Heat Desiccation Means  
40 -- Host CPU  
41 -- Image Formation Means  
42 -- Image Memory  
43 -- Interface Control Means  
44 -- Record Control Means  
45 -- Dot Count Measurement Means  
46 -- Temperature Psychrometry Means  
47 -- Desiccation Conditioning Means  
51 -- Recording Head  
52 -- Conveyance Roller  
53 -- Detail-Paper Cartridge  
53a -- Thermometer  
53b -- Hygrometer  
54 -- Cutter  
55 -- Desiccation Means  
55a -- Desiccation heating roller  
55b -- Desiccation pressurization roller  
55c -- Drying heater  
55d -- Conveyance path change flap  
55e -- Desiccation nip  
55f -- Heater temperature controller  
56 -- Fixing Means  
56a -- Imprint sheet  
56a1 -- Base material  
56a2 -- Surface material layer  
56a3 -- Adhesive layer  
56b -- \*\*\*\* is carried out and it is a roll.  
56c -- Guide idler  
56d -- Fixing heating roller  
56e -- Fixing pressurization roller  
56f -- Fixing nip  
56g -- Rolling-up roll  
56h -- Fixing heater  
57 -- Cooling Means  
58 -- Separation Section  
59 -- Delivery Roller  
60 -- Paper Output Tray  
61 -- Recording Paper  
62 -- Recording Head Control Section  
63 -- Fixing Conveyance System

- 70 -- Cleaning Means
  - 70a -- Nonwoven fabric
  - 70b -- \*\*\*\* is carried out and it is a roll.
  - 70c -- It presses and is a roller.
  - 70d -- Rolling-up roll
- 80 -- Desiccation Means
  - 80a -- Heating fan
  - 80b -- Desiccation tunnel
  - 80c -- Jet pipe
- 90 -- Form Weight Measurement Means
  - 90a -- Recording paper tray
  - 90b -- Conveyance roller
  - 90c -- Weight measuring instrument
- 91 -- Form Distinction Means
  - 91a -- Form distinction sensor

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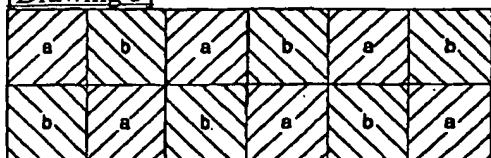
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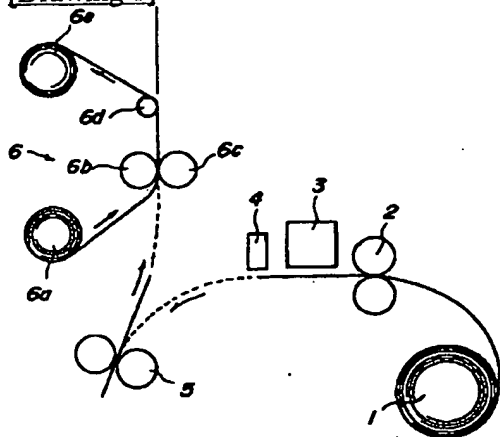
DRAWINGS

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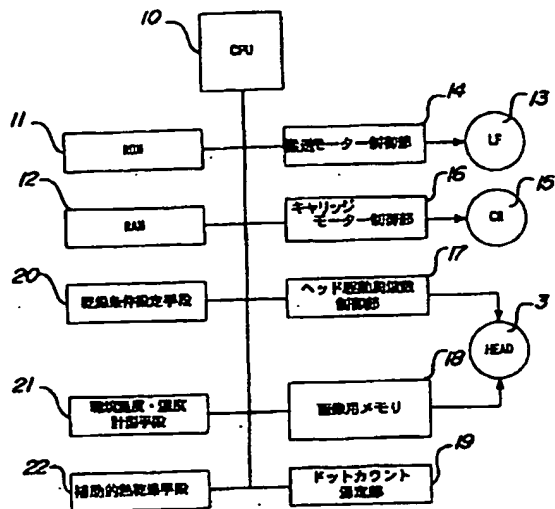
[Drawing 5]



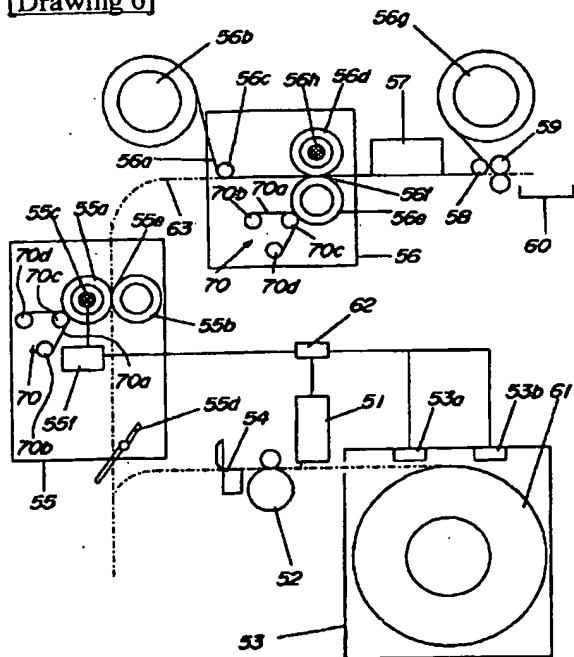
[Drawing 1]



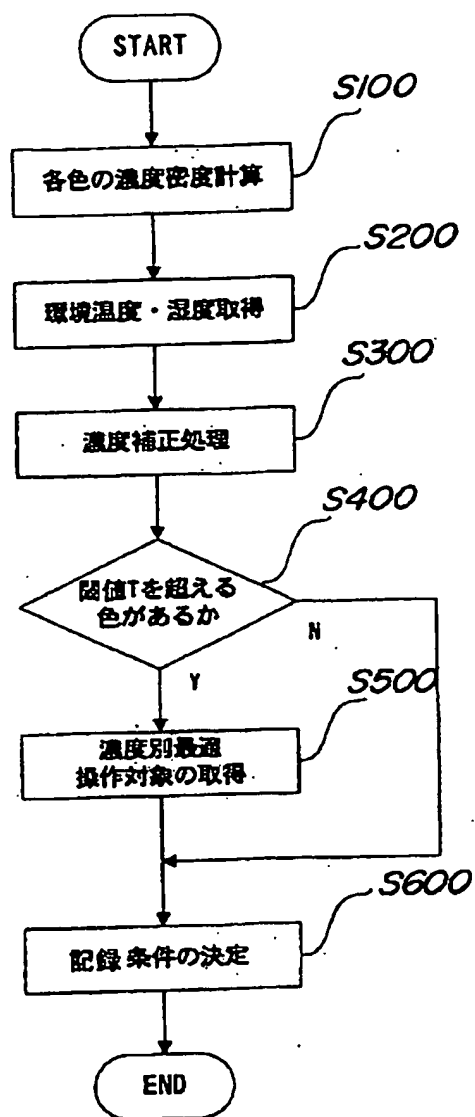
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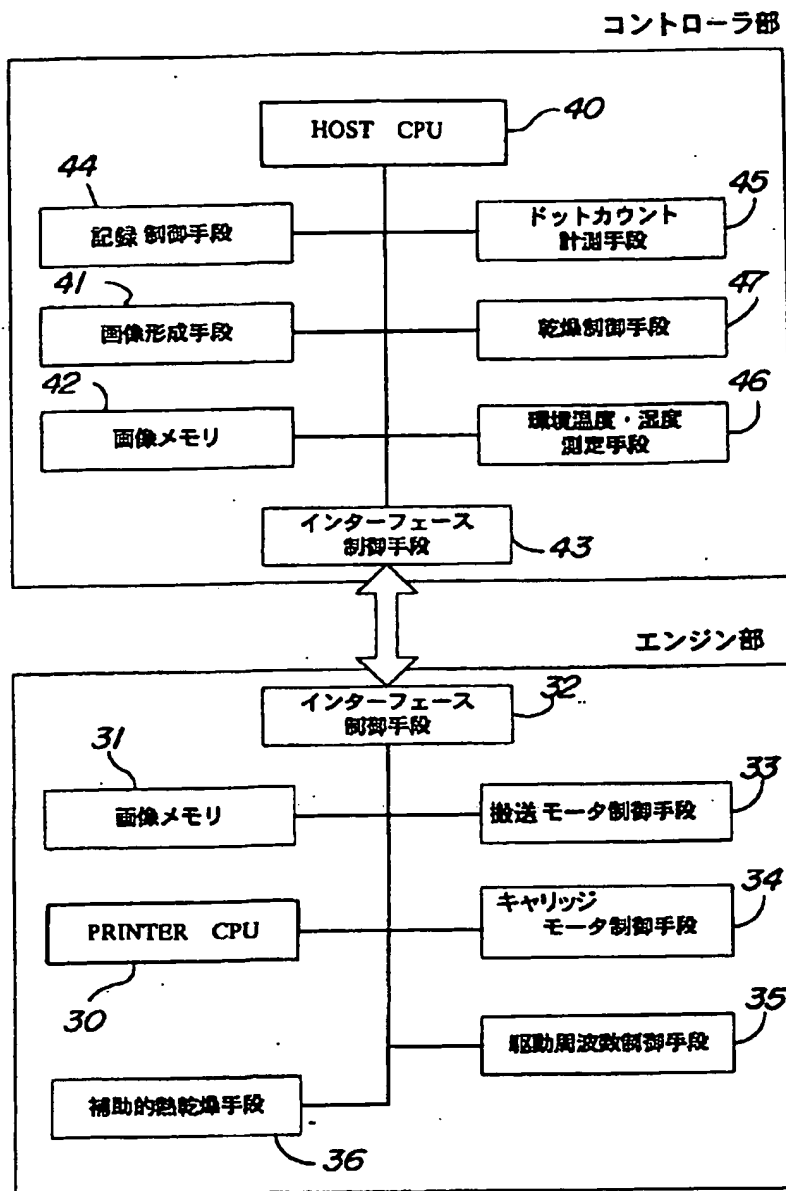
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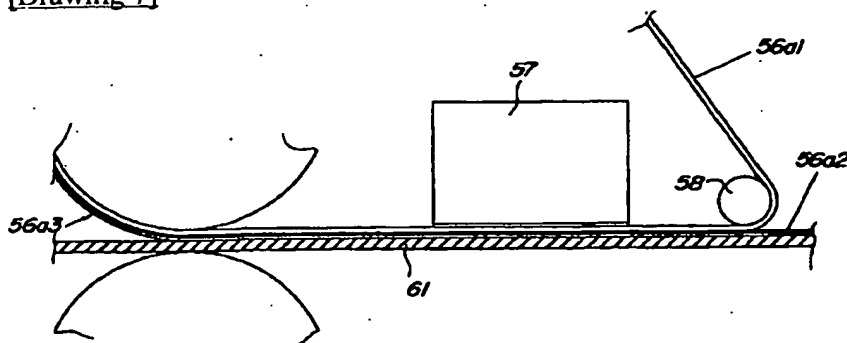
[Drawing 10]



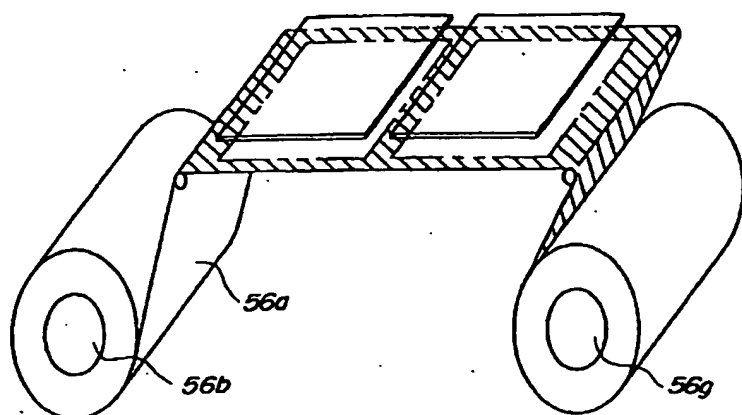
[Drawing 4]



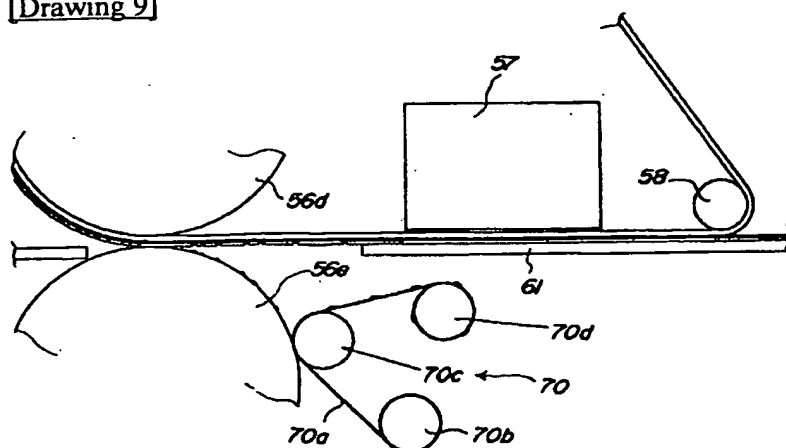
[Drawing 7]



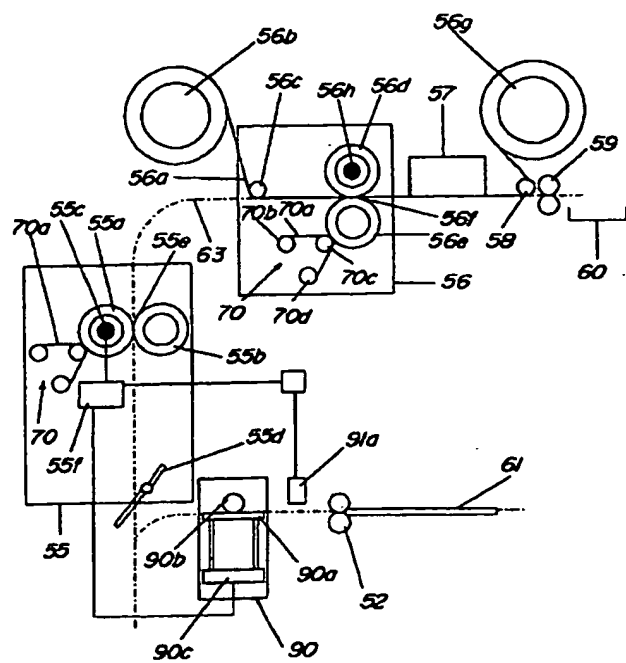
[Drawing 8]



[Drawing 9]



[Drawing 11]



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